



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ :

H04L 29/00

A2

(11) International Publication Number:

WO 00/38389

(43) International Publication Date:

29 June 2000 (29.06.00)

(21) International Application Number: PCT/US99/29163

(22) International Filing Date: 9 December 1999 (09.12.99)

(30) Priority Data:
09/217,276 21 December 1998 (21.12.98) US(71) Applicant: DMR CONSULTING GROUP INC. [US/US]; 333
Thornall Street, Edison, NJ 08837 (US).(72) Inventors: HAYWARD, Mark, Roderick; 15 Sutton Court,
Bridgewater, NJ 08807 (US). ANDERSON, Richard, Mark;
6 Marshall Road, Neshanic, NJ 08853 (US). KOERBER,
James, Beecher, 489 Community House Road, Southbury,
CT 06488 (US). LYAU, Jyunda (NMI); 67 Laura Avenue,
Edison, NJ 08820 (US).(74) Agent: LOVEJOY, David, E.; Fliesler, Dubb, Meyer and
Lovejoy LLP, Suite 400, Four Embarcadero Center, San
Francisco, CA 94111-4156 (US).(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG,
BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, EE, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG,
MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,
SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU,
ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL,
SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ,
MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE),
OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML,
MR, NE, SN, TD, TG).

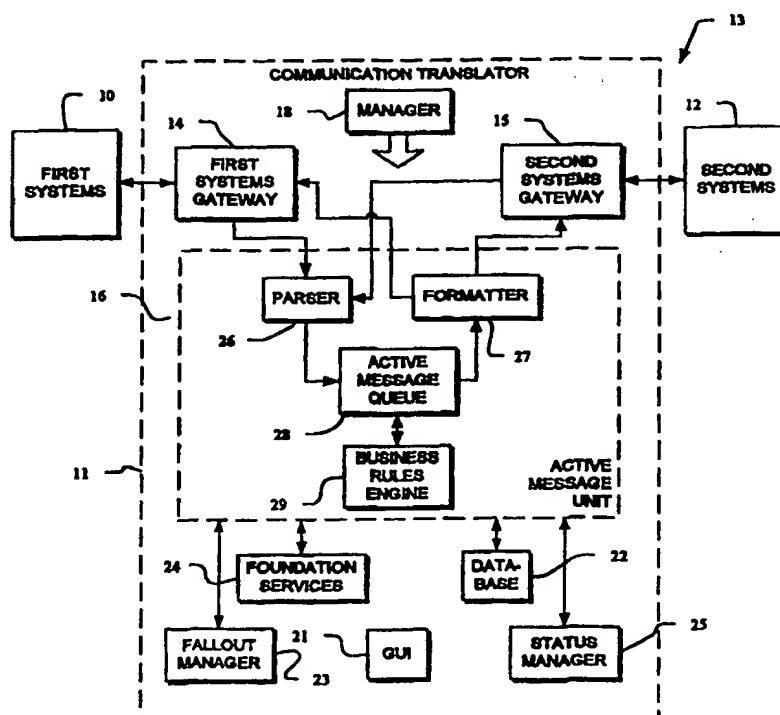
Published

Without international search report and to be republished
upon receipt of that report.

(54) Title: METHOD AND APPARATUS FOR COMMUNICATIONS TRANSLATIONS BETWEEN DIFFERENT COMMUNICATIONS SYSTEMS

(57) Abstract

A communication translator that provides a bridge between operations of a first system (such as a CLEC) and operations of a second system (such as an ILEC) to implement commercial transactions. The first systems (such as a CLEC system) operate with first messages having first forms and the second systems (such as an ILEC system) operate with second messages having second forms. The communication translator includes an active message unit for processing active ones of the messages. The active message unit includes a parser for parsing the first messages into message objects that are independent of the first and the second forms, a rules engine for processing the message objects to form processed message objects, a formatter for formatting the processed message objects, and a manager for controlling the flow of the first messages, the second messages and the message objects to cause messages to be translated between the first and second forms whereby transactions are communicated between the first systems and the second systems.



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TITLE**METHOD AND APPARATUS FOR COMMUNICATIONS TRANSLATIONS
BETWEEN DIFFERENT COMMUNICATIONS SYSTEMS**

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Background of the Invention

The present invention relates to the field of electronic commerce and more particularly to commerce of the type that transpires between different companies.

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Historically, telephone systems were based upon switching offices (central offices) that were centrally located to minimize wiring requirements. Cabling and office locations were generally based upon geographic factors and telephone population density. The historical access loops used twisted-pair copper and cable plant and switching systems were hard-wired with generally with one line per household or business. Interexchange calling was integral to the telephone network.

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Telephone companies have developed to operate in two different parts -- the "front" office part, where the customer facing and network functions take place; and the "back" office part, where general business functions take place. Front-office functions are those which are involved with customer operations and which are operated in a manner unique to the industry. Back-office functions are those operations which any company requires, regardless of the type of business.

20

Telecommunications management have been grouped in the categories of operations, administration, maintenance and planning (OAM&P). Operational support systems (OSS) are those front-office systems providing OAM&P and were developed to provide customer support and service delivery.

25

Historical OSS were optimized to the historical configuration -- one line, one number, hard-wired without any expectation of many changes. These OSS were developed and built by Bellcore so as to ensure commonality and standardization among the Bell companies. OSS applications in use within the former Bell System include TIRKS (Trunk Inventory Record Keeping System), LFACS (Loop Facility

Assignment), MARCH (Memory Administration for Recent Change), ARIS (Access Request Information System) to process IXC (Inter-Exchange Carrier) orders, NPS (Network Planning System) and COSMOS (Computer System for Mainframe Operations).

5 New systems have been developed to provide newer services involving advanced intelligent network (AIN) integration, ISDN and special services. Each telecom provider has similar core systems which provide OAM&P but hundreds of applications have been developed customizing core OSS and for providing new services. As a result of these developments, many unintegrated systems exist for
10 OSS, business support systems (BSS), and advanced intelligent network (AIN) integration. These systems are important since greater than 40% of operational budgets for telephone companies are allocated to maintain network management and operational support systems.

 The communications industry is undergoing substantial change due to a
15 number of factors including the Telecommunications Act of 1996, the Internet, Globalization, PCS, wireless, and broadband services.

 The number of competing telephone companies is increasing and communications among competing telephone companies is similarly increasing. The development of new technologies and the diversification of telephone services
20 among different companies results in the use of different inter-connection protocols and formats and results in different commercial methods for handling orders and other commercial transactions. These different inter-connection protocols, formats and commercial methods are not inherently compatible and therefore lead to impediments in the commerce among telephone companies. New developments
25 have introduced greater cost and additional complexity in the systems environment since OSS, BSS and AIN systems were not developed for other than internal telecom personnel. New developments have resulted in inconsistency in technology,

operations, and data types. The convergence of cable, wireless, and traditional wireline have increased complexity.

5 In the United States, the spawning of new telephone companies is accelerating because of the Telecommunications Act of 1996 which was enacted to promote competition among both long-distance and local phone service providers. Telephone companies in the United States that were providing local service when the Telecommunications Act of 1996 was enacted are known as ILECs (incumbent local exchange carriers). ILECs include the former Bell operating companies (BOCs) which were grouped into holding companies known collectively as the
10 regional Bell operating companies (RBOCs) when the Bell System was broken up by a 1983 consent decree. ILECs are distinguished from CLECs (competitive local exchange carriers). A CLEC is a telephone company that competes with the already established local telephone business of an ILEC by providing network and switching in competition with an ILEC. ILECs and CLECs are each local exchange carriers
15 (LECs).

A "local exchange" is the local "central office" of an LEC. Lines from homes and businesses terminate at a local exchange. Local exchanges connect to other local exchanges within a local access and transport area (LATA) or to interexchange carriers (IXCs) such as long-distance carriers AT&T, MCI, and
20 Sprint.

There are many CLECs operating over the United States that range in size from small community-based firms to national corporations. New facilities-based local exchange carriers (LECs) are building networks for telecommunications traffic and the new facilities-based LECs interconnect with the incumbent ILEC's
25 networks and purchase unbundled network elements such as subscriber loops from the ILECs. The requirement that ILECs unbundle and provide access to local loop information has accelerated the need for interconnecting systems with different custom infrastructures.

In order to satisfy the interconnection needs of telephone companies, electronic interfaces between networks and back-office systems of different telephone companies are necessary. Electronic operational support systems (OSS) which provide real-time information about the status of orders, provisioning, maintenance, repair and billing for one telephone company must be connected to the corresponding operational support systems of competing telephone companies. The interconnection of such systems is impeded by the differing inter-connection protocols, formats and commercial methods used by the different companies.

More generally, as communication systems expand with new or differing inter-connection protocols, formats and commercial methods, a need exists for improved methods and apparatus for system interconnection.

Summary of the Invention

The present invention is a communication translator for interconnecting communications systems. The communication translator provides a bridge between operations of a first system (such as a CLEC system) and operations of a second system (such as an ILEC system).

The present invention operates in a network formed of one or more first systems and one or more second systems operating with messages to implement commercial transactions. The first systems (such as an CLEC system) operate with first messages having first forms and the second systems (such as an ILEC system) operate with second messages having second forms. The communication translator includes an active message unit for processing active ones of the messages. The active message unit includes a parser for parsing the first messages into message objects that are independent of the first and the second forms, a rules engine for processing the message objects to form processed message objects, a formatter for formatting the processed message objects, and a manager for controlling the flow of the first messages, the second messages and the message objects to cause

messages to be translated between the first and second forms whereby transactions are communicated between the first systems and the second systems

5 The communication translator provides the flexibility required to handle different inter-connection protocols and formats such as EDI, CORBA, TCP/IP, CMIP and X.25 and different commercial methods of operation. Particularly, the communication translator provides for the external control of behavior via user definable rules in order to facilitate the application of business logic to messages flows, translations and formatting while using different communication transports for the interconnected first and second systems. The communication translator includes, protocol independent, message objects that enable disparate message types and formats to be handled within the communication translator in a uniform fashion.

10 The communication translator is an electronic commerce framework that provides order management, error management and gateway connectivity to support the inter-company ordering and other business processes within industry and provides an effective, flexible and automated approach to the business process of sending and receiving messages between trading partners. An example is the sending of orders for local circuits from a CLEC (Competitive Local Exchange Carrier) to an ILEC (Incumbent Local Exchange Carrier).

20 The foregoing and other objects, features and advantages of the invention will be apparent from the following detailed description in conjunction with the drawings.

Brief Description of The Drawings

25 FIG. 1 depicts a communication network including a communication translator for translating communications between first systems and the second systems.

FIG. 2 depicts the communication translator of FIG. 1 in further detail.

FIG. 3 depicts a communication network including a communication translator for translating communications between an internal CLEC system and external ILEC, E911 and other external trading partner systems.

FIG. 4 depicts a graphical user interface screen representation for business rules definitions.

FIG. 5 depicts the hierarchical structure of data organized into messages.

FIG. 6 depicts the message timing of the communications translator in response to an order from a CLEC.

FIG. 7 depicts the message timing of the communications translator for a response from an ILEC to the order from the CLEC of FIG. 4.

FIG. 8 depicts the operation of the business rules engine.

Detailed Description of the Invention

Communication Network — FIG. 1

In FIG. 1, a communication network is made up of a plurality of different systems including first systems 10 and second systems 12. The first systems 10 are, for example, competitive local exchange carriers (CLEC) and the second systems 12 are, for example, incumbent local exchange carriers (ILECs). The first systems 10 and the second systems 12 operate with different inter-connection protocols, formats and commercial methods and, in order to connect them together so that they operate as an integrated system, communication translator 11 is required. The communication translator 11 translates the communications between the first systems 10 and the second systems 12 so that the differences in protocols, formats and commercial methods used by the different systems are harmonized. By way of example, a business transaction such as a work order is communicated from first systems 10 to second systems 12. Similar, a business transaction such as a response to a work order is communicated from second systems 12 to first systems 10. These communications of business transactions back and forth occur notwithstanding that

the first systems 10 and the second systems 12 may operate with different inter-connection protocols, formats and commercial methods.

Communication Translator In A Communication Network — FIG. 2

5 In FIG. 2, the communication translator 11 of FIG. 1, between the first systems 10 and the second systems 12, is shown in further detail. The communication translator 11 includes a first systems gateway 14 for providing gateways to the first systems 10. The second systems gateway 15 provides gateways to the second systems 12. A business transaction, such as a work order,
10 connects from the first systems 10 through the first systems gateway 14 to a parser 26 which parses the work order into active messages. The active messages from the parser 26 are stored in an active message queue 28. The active messages are processed by a business rules engine 29 which forms processed active messages according to the business rules of the business rule engine 29. The processed active
15 messages from the active message queue 28 are forwarded to the formatter 27. Formatter 27 receives the processed messages from the data store 28 and formats them for the second systems 12. The formatted messages are forwarded through the second systems gateway 15 to the second systems 12.

A business transaction, such as a response to a work order, that originates
20 with the second systems 12 is communicated through the second systems gateway 15 to the parser 26 and is parsed into active messages that are stored in the active message queue 28. The parsed messages in data store 28 are operated upon by the business rules engine 29 to form processed active messages in the message data store 28. These processed active messages are forwarded to the formatter 27
25 which formats the processed components for the first systems 10 and the formatted messages are passed through the first systems gateway 14 to the first systems 10.

The active message unit 16 includes the parser 26, the formatter 27, the active message queue 28 and the business rules engine 29. The active message unit

16 is controlled by a manager 18 which controls work flow and other processing. The status of business transactions, such as work orders and responses, is reported by the status manager 25. Unexpected occurrences in a business transaction are handled by the fallout manager 23. Other services in connection with the active message unit 16 are provided by the foundation services 24. The foundation services include, for example, an event log, an error log, a message timer and a database manager. A data base 22 is provided for storage of information used by the communication translator 11. A graphical user interface 21 is provided for user inputs and outputs to the communication translator 11.

Communication Translator In An Internal System — FIG. 3

In FIG. 3, the communication translator 11 of FIG. 2 is part of an internal system 35 that also encompasses a CLEC system 10-1 as an embodiment of the first systems 10 of FIG. 2. In FIG. 3, external systems 12 are an embodiment of the second systems 12 of FIG. 2 and encompass trading partners for the CLEC system 10-1. By way of example, the external systems include an ILEC system 12-1, an E911 system 12-2 and other external trading partner systems (such as a calling card system or a trouble management system) 12-S. The communication translator 11 includes a CLEC gateway as an embodiment of the first systems gateway 14 of FIG. 2 for providing a gateway to the CLEC system 10-1. In FIG. 3, the external gateways 15 are embodiments of the second systems gateway 15 of FIG. 2 and include ILEC inter-connection protocol 17-1 (such as EDI), an E911 inter-connection protocol 17-2 (such as COBRA) and a trouble management inter-connection protocol 17-S (such as CMIP). The ILEC inter-connection protocol 17-1, the E911 inter-connection protocol 17-2 and the trouble management inter-connection protocol 17-S provide inter-connection protocols to the ILEC system 12-1, the E911 system 12-2 and the other system 12-S, respectively. Communications, such as a work order, connect from the CLEC system 10-1

through the CLEC gateway 14-1 to a parser 26 which parses the work order into active messages. The active messages from the parser 26 are stored in an active message queue 28. The active messages are processed by a business rules engine 29 which forms processed active messages for each one or more of the different external systems as is appropriate for the work order according to the business rules of the business rule engine 29. The processed active messages from the active message queue 28, for each one or more of the different external systems, are forwarded to the formatter 27. Formatter 27 receives the processed messages from the data store 28 and formats them appropriately for each one or more of the different external systems 12. The formatted messages for each of one or more of the different external systems 12-1, 12-2, ..., 12-S are forwarded through the external gateways 15, using an appropriate one of the interconnection protocols 17-1, 17-2, ..., 17-S, to the external systems 12.

Communications, such as responses to work orders, that originate with the external systems 12-1, 12-2, ..., 12-S are communicated through the external gateways 15 using an appropriate inter-connection protocol 17-1, 17-2, ..., 17-S, to the parser 26 and are parsed into active messages that are stored in the active message queue 28. The parsed messages in data store 28 are operated upon by the business rules engine 29 to form processed active messages in the message data store 28. These processed active messages are forwarded to the formatter 27 which formats the processed components for the CLEC system 10-1 and the formatted messages are passed through the CLEC gateway 14-1 to the CLEC system 10-1.

The CLEC gateway 14-1 provides the interface between communication translator 11 and the internal CLEC system 10-1. The CLEC gateway 14-1 is responsible for retrieving messages using the protocol specified for the interface, verifying key components of the message, logging the receipt and passing the message along for further processing.

The active message unit 16 includes the parser 26, the formatter 27, the active message queue 28 and the business rules engine 29. The active message unit 16 serves as a common cache, using active message queue 28, for messages that are 'in flight' inside the communication translator 11. The caching de-couples message senders and receivers (internal CLEC system 10-1 or external systems 12) and allows them to function at varying speeds either synchronously or asynchronously. The active message unit 16 is controlled by a manager 18 which controls work flow and other processing. The status of work orders and responses is reported by the status manager 25. Unexpected occurrences are handled by the fallout manager 23. The fallout manager 23 manages creation and storage of fallout objects. Each fallout object is associated with one and only one message object. Other services in connection with the active message unit 16 are provided by the foundation services 24. The foundation services include, for example, an event log, an error log, a message timer and a database manager. A data base 22 is provided for storage of information used by the communication translator 11. A graphical user interface 21 is provided for user inputs and outputs to the communication translator 11.

In FIG. 3, the internal system CLEC gateway 14-1 and the external system gateways 15, using for example the ILEC inter-connection protocol 17-1, each create message objects that are stored in the active message queue 28 and the manager 18 directs the processing of the active messages including invoking the rule engine 29. The external gateways 15 using the ILEC inter-connection protocol 17-1, by way of example, is responsible for managing the communications between communication translator 11 and the ILEC external system 12-1 and similar operation occurs for the other Trading Partners (Tps) 12-2, ..., 12-S. The External gateways 15 provides support for the different protocols that are used to communicate with the ILEC system 12-1. The External gateways 15 retrieves outbound messages (message objects) from the active message queue 28 and sends

them to the ILEC 12-1. On success, the External gateways 15 updates message status in the database 22. The External gateways 15 receives inbound messages from the ILEC 12-1 and performs simple readability verification of messages to make sure that valid messages are entering the communication translator 11. The
5 External gateways 15 stores verified message objects in the active message queue 28 and then updates status in the database 22.

In FIG. 3, the rules engine 29 encompasses the functionality associated with processing user defined business rules within the communication translator 11. User defined business rules are defined, for example, using a graphical user
10 interface (GUI) 21.

The manager 18 provides the ability to "program" the steps that an individual message goes through as it is processed by communication translator 11. Translation, transformation and verification is done via parsing in parser 26, formatting in formatter 27 and application of business rules in rule engine 29. The
15 manager 18 dynamically sets up a work flow path for each message based on predetermined criteria for each message. A combination of three factors Message Destination/Message Type/Message Version determine the flow. Manager 18 also controls the processing of response messages by associating responses to orders and interpreting the response message detail.

20 The communication translator 11 provides an electronic trading platform that builds a bridge between internal CLEC system 10-1 and the external trading partner systems 12. The platform provides the flexibility required to handle a range of inter-connection protocols and formats, for example, EDI, CORBA, TCP/IP, CMIP and X.25. Particularly, the platform provided by communication translator
25 11 provides for the external control of behavior via user definable rules in order to facilitate the application of business logic to messages flows, translations and formatting. The platform is preferably of a plug-in design capable of supporting the various required communication transports. The platform is able to provide such

capability through use of an internal, protocol independent, message object that provides an abstraction that enables disparate message types and formats to be handled in a uniform manner.

5 The communication translator 11 furnishes a framework designed to provide order management, error management and multi-protocol gateway connectivity that supports local service oriented business processes like those found in the telecommunications industry. Specifically, the communication translator 11 supports CLEC (Competitive Local Exchange Carrier) to ILEC (Incumbent Local Exchange Carrier) local service ordering communications in a Total Service Resale (TSR) environment and can be used in the processing of Unbundled Loops (UNE-
10 L) and Unbundled Platforms (UNE-P). A highly complex area of electronic commerce, TSR is comprised of three high- level business functions: Pre-order, Ordering/Provisioning and Trouble Management.

15 The communication translator 11 is based on component layers providing workflow management, rules-based message evaluation, translation and formatting, status or state management and integrated fallout management. Orders from first systems 10 that arrive at the communication translator 11 are processed, formatted, and delivered to one or more workflow targets. The major modules of the communication translator 11 are rules driven and of the type that can be maintained
20 by users or development personnel, and are external to the application programs using them. Operation is either synchronous or asynchronous to either source or target depending on message type.

The major functions of the communication translator 11 are as follows:

25 **Workflow Management.** The translator 11 provides a user configurable capability to direct the processing of messages, from the internal gateway 14 to the external gateway 15 or vice versa. The work flow manager 18 directs which translation and formatting steps a message will follow.

Message Translation & Formatting. The communication translator provides facilities to define rules that are applied to messages in order to translate them and format them in the appropriate way for handling by the receiving system or organization.

5 **Status Management.** The nature of electronic trading is such that, for example, to provide a customer with a particular service or product might require multiple message interactions between partners (between first systems 10 and second systems 12) in order to accomplish the task. The communication translator 11 tracks these interactions and manages the state of the interaction. The manager 10 18 utilizes state information in order to determine the next processing steps.

Fallout Management. The communication translator 11 provides an integrated facility to direct messages for correction and reprocess messages or responses that contain data, formatting or translation errors.

15 **Metrics Reporting.** The communication translator 11 captures detailed metrics on events that occur within the system. These events are captured and stored in a reporting database that can provide a variety of fixed or ad-hoc reports relative to such things as orders received, orders completed, orders in jeopardy or overdue, orders completed late, etc.

20 Service Order/Provisioning in the communication translator 11 allows for the creation of orders for CLEC system 10-1 to facilitate the acquisition of customers with or without existing service along with changes to existing service and includes move orders as well as dual/duplicate service. In addition to support for initial service orders, the communication translator 11 supports subsequent service orders, simple and complex directory listings, changes to requests, order completion, order cancellation, partial disconnect orders, suspend service, restore 25 service, temporary suspensions and termination of service.

The different Order Types include the following:

New Orders.

Migration As Specified – establishing a new customer for local services, migrating from an ILEC with addition and deletions.

New Telephone Service – establishing a new customer with new telephone service (moving from another jurisdiction), acquiring local service (no existing service), inside wiring needs or voice mail using a third party vendor.

Change Orders.

Add, change, delete information (features/services) on an existing customer record/account

Temporary disconnect and re-connect customer's service (seasonal)

Change of telephone, removal of a telephone number, add a number (line)

Suspend for non-payment, restore on receipt of payment

Outside move service (move to a new location), sometimes with a overlap of service

Moving into a new ILEC area

Disconnect the service from CLEC , ILEC and (TPP if applicable)

Inside move of service (within the same premise)

Change of PIC/LPIC

Supplemental Orders (Supps). Supps are changes, additions, and/or deletions to pending order(s) sent to the ILEC or TPP. They are versions of the original Service order.

Cancellation Orders. Cancellation of pending service order for new orders, change orders and supplemental orders.

Order/Provisioning Flow

Before the communication translator 11 processes the Service Order information (Request) it expects that the CLEC 10-1 will pass the Service Order information to the communication translator 11 in CLEC format. The communication translator 11 expects this format to be a known format (such as LSR) using tags (name values).

The CLEC system 10-1 composes and transmits a Service Order in an agreed upon format that will include but is not limited to the following tasks:

Perform pre-order functions

Generate a PON (Purchase Order Number)

Perform service address validation (Service Address Guide, SAG,)

Request and assign telephone number(s)

Request due date availability, assign due date(s) to services ordered

Get the customer service record (CSR) information from the ILEC
if an ILEC customer and/or internal CLEC system

Get the customer information from another CLEC

Request and provide product and service information

The service request prepared by CLEC system 10-1 will include all services ordered by the customer including the services to be provided by TPP (Third Party Providers). This operation is in addition to the pre-ordering functions above. A standard interface is developed in order to exchange information.

A CLEC system 10-1 is expected to pre-edit the Service Order information for format and completeness before releasing the order to the communication translator 11 as best as possible using, for example, the same business rules engine 29 as that employed by the communication translator 11.

The ILECs system 12-1 are expected to clearly define the communications protocol and mechanisms for each transaction. For example, the communication translator 11 can process the service request from first systems 10-1 to system 12-1

via the gateway 15 in EDI or CORBA format via system 12-1 (CLEC 's) existing communication services.

5 The communication translator 11 processes the Service Order Request received from a CLEC system 10-1 via the CLEC gateway 14 through the issuing of a request to an ILEC via external gateways 15. The process involves communicating between the CLEC system 10-1 and ILEC system 12-1 on a batch or event-driven/asynchronous basis to accept the Service Order information, process it and pass it on to system 12 in EDI format, for example, via the gateways 15. Third Party Provider (TPP) work orders to other ones of the second system 12 will also be transmitted to the Third Party Providers (TPP) in EDI or other formats. 10 The message will be built, edited, translated and decomposed into work orders and transformed into the interface specification that the external systems 12 can recognize and process. The Pre-Order process involves the same CLEC gateway 14-1 and ILEC inter-connection protocol 17-1. Pre-Order transactions are built, for example, using a CORBA interface and are synchronous/asynchronous as supported by an interface for the particular ILEC system 12. 15

Order Translation & Decomposition.

The communication translator 11 accepts order information in, for example, LSR TCIF (Telecommunication Industry Forum) format, from the ordering component of a CLEC system 10-1. The communication translator 11 converts 20 codes into a common format. The converted file then undergoes Business Rule Validation and Decomposition into Work Orders. Prior to being converted into the format for dispatch to an ILEC or to another TPP system 12, the file may once again have to be translated into an acceptable set of codes (for example, BellCore, 25 USOCs and FIDs) compatible with the ILEC/TPP back office systems of the different systems 12. Business rules are generally customized with each communication translator 11 deployment. If an error occurs in the translation, the work fallout manager 23 handles correction procedures. All data input errors are

returned to their source for correction. Other system-type errors, such as those resulting from table errors or bad business rules, are corrected within the internal system by the work fallout manager 23 and the orders are reprocessed after correction.

5

The following actions take place in the communication translator 11:

1. Parse, Translate and store orders into active messages in the active message queue 28.
2. Validate active messages through the business rules engine (BRE)
10 29 and carry out Protocol conversion.
3. Update Status
4. Responses flow to orders through BRE and prepare Billing
Decompositions.

15 *Order Fallout Management*

Order Requests entering the communication translator 11 are subjected to edits for the order's completeness and correctness. The status manager 25 labels the Service Order Request (SOR) RECEIVED. The SOR is then processed through the communication translator 11. An SOR is sent to the fallout manager
20 23 with an ERROR () status if any of the following occur:

- The order fails Format or Content validation.
- The order fails Business Rule validation.
- Code Translation is unsuccessful.
- Work Order Decomposition cannot be completed.
- 25 Translation to ILEC file format cannot be completed.
- ILEC/TPP find errors and cannot complete request.

The communication translator 11 uses the fallout manager 23 for handling errors and jeopardy situations identified in the ordering and provisioning processes.

The communication translator 11 contains graphical user interfaces (GUI) 21 that allow representatives to receive errors, identify jeopardy situations and receive alarms based on benchmark criteria defined by a CLEC system 10-1 for investigation and resolution. The fallout manager 23 corrects or updates as needed and re-submits through the order taking component system.

Order Status Tracking

Order status in the communication translator 11 is controlled by the status manager 25. The status manager 25 controls the creation and passing of status information to the Core Components of a CLEC system 10-1. The communicator translator 11 assists CLEC's Service Representative Manager and the Service Representative in the day to day management of their provisioning process and provide access to Order information and their respective states. The status manager 25 maintains a cumulative record of transactions passing through the communication translator 11. The status manager passes a final status to a CLEC system 10-1 when received from the ILEC/TPP system 12. The status manager 25 is made available to the order taking component in an effort to avoid "race conditions", or those situations that occur when a change on an existing order is made without knowing that the ILEC system 12 has completed (or rejected) an order.

The communication translator 11 requires:

The Service Order States are assigned by the status manager 25 and accessed by the CLEC system 10-1 as required via the Core Components of the CLEC system 10-1. The ILEC and Third Party systems 12 are able to communicate with the communication translator 11 for acknowledgments and status information. Status labels and their definitions are maintained in tables by CLEC system 10-1.

A list of common status types in the communication translator 11 are as follows:

1. RECEIVED - Has entered communication translator 11 through the CLEC system 10-1 Core Component subsystem
- 5 2. TRANSFERRED ()- Has been submitted to the ILEC/TPP systems via the ILEC gateway 15.
3. CONFIRMED () - An order has been Received and the negotiated due dates have been confirmed by the ILEC/TPP systems 12.
- 10 4. COMPLETED - All work has been completed by the negotiated due date.
5. CLOSED - The SO has been completed and CLEC system 12 has been notified for verification and follow-up with the customer.
- 15 6. ARCHIVED - The SO and all ancillary documents are retained for a negotiated period of time.
7. ERROR () - An error has occurred while being processed in communication translator 11 and has been routed to the Fallout manager 23.
- 20 8. JEOPARDY () - The Work Order has not been completed within the negotiated due date.
9. REJECTED () - The ILEC/TPP systems 12 have rejected the Work Order for content.
- 25 10. CANCELLED - The SO has been withdrawn by CLEC Core Component system.

Reporting.

The communication translator 11 has the ability to prepare reports to track Orders and System metrics using a Report Scheduler and also gives users the ability to create their own adhoc reports. Typical communication translator 11 reports included the following:

5 *Status Reports*

Status Reports will show the state of any Service Order /Work Order in the system:

- Service Order Status Detail Report
- Work Order Status Detail Report
- 10 Service Order Detail by PON Report
- Service Order Detail by Status Report
- Service Order Status Statistics by Date Received Report
- Service Order Status Statistics by Due Date Report
- Work Order Detail by Due Date Report
- 15 Work Order Detail by Date Received Report

Error Reports

Error Reports target Service Orders/Work Orders in error or jeopardy states:

- Service Order Fallout Report
- 20 Service Order Fallout Exception Report
- Service Order Not Confirmed Exception Report

Statistical Reports

- Reports on system performance (DMOQ):
- Service Order Completion Interval Detail Report
- 25 Work Order Completion Interval Detail Report
- Trading Partner Activity Summary Report
- Trading Partner Confirmation Interval Report

System Administration Reports

Reports on system tables and administrative information:

Trading Partner Report

ILEC/TPP Communication Information Report

CCNA Report

5 Message Extractor Helper Report

Message Process Helper Report

BRE Rule Information Report

Multi-Protocol Translations

10 The communication translator 11 supports multi-protocol translations and transport using a variety of products to offer customers flexibility. In one embodiment, TSI's Mercator transformation engine is used in the communication translator 11 for performing data transformations including EDI translations. Mercator offers a Windows-based authoring tool providing a powerful, yet easy to use interface to define the type trees and maps necessary to transform data between

15 formats.

The communication translator 11 is typically CORBA compliant and typically processes interactive transactions whether they be CORBA or EDI. The translator 11 typically uses the ORBIX ORB for internal message routing. Once the

20 Interface Definition Language (IDL) standards are defined for the Pre-Order transactions the communication translator 11 is ready to use them. Typically, a plug in architecture is used in the communication translator 11 so that new transport protocols such as TMN using CMIP/CMISE or X.400 over Frame Relay can be added without changing internal system components.

Systems Management

25 The communication translator 11 typically uses Tivoli to manage processes. This product operates architecturally on top of the communication translator 11 and can be replaced with a system administration product employed by a CLEC system

10-1. It provides a host of capabilities including the management of individual mission critical processes so that in the event of a failure, the communication translator 11 can notify the appropriate staff, for example, via e-mail, by visual alarms or paging services.

5 The communication translator 11 provides Graphical User Interfaces (GUI) 21 for entering configuration instruction such as trading partner parameters, process flow rules, and alarming conditions.

Scalability

10 The communication translator 11 supports the use of RAID data storage devices in the data storage facilities 22 and typically uses Oracle replication to provide increased database reliability. Typically, the component based design of the communication translator 11 allows for server clustering to provide growth capabilities and the architecture supports multiple instance processing to provide growth without burdensome hardware investment. Asynchronous messaging using
15 provides a robust and flexible routing of messages that is easy to integrate with existing Core Components.

Rule Definition – FIG. 4 And FIG. 5

20 Rules are defined by a series of *conditions* and *actions* to be performed if the conditions are met. The rules are specified using a four-quadrant visualization paradigm as shown in FIG. 4. *Conditions* (if rules) are expressed in the upper left quadrant by specifying the appropriate Section and Item in the message object e.g., IDINFO:Action, and a condition (=, Not =, >, <, etc.) e.g., = "A". *Conditions* are either True or False. The Upper and Lower Right quadrant tie *Conditions* and
25 *Actions* together. If a *Condition* is True (Y) or False (N) the series of *Actions* (1 to n) specified in the corresponding column in the lower quadrant is executed. In the example below, – If IDINFO:Action = "A" is True And LINEDETAIL LF:PIC =

NULL is True Then an error message is returned stating that "Manadatory PIC is missing for Migration".

Rules are given names and are executed against Messages based on the message type, the destination of the message and the version of the message. In the example of FIG. 4, the rule "Validate pic_lpic" is applied to messages going to Bell Atlantic (BAT), of type New Order (New) at version V1-Mass (Massachusetts).

The business rules engine (BRE) 29 utilizes data that has been transformed into a hierarchical structure of Sections and Items. Each Section and Item is identified by a Tag Name. Each value is represented as a character string. Storing messages in this simple format provides enormous flexibility. Practically any type of information can be stored and retrieved using this format. The BRE 29 transforms the input message format into data objects that are processed by the Rules Engine. The static relationship between the classes used is illustrated in FIG. 5.

Outbound Order Flow -- FIG. 6

FIG. 6 depicts the message timing of the communications translator in response to an order from a CLEC.

Inbound Response Flow -- FIG. 7

FIG. 7 depicts the message timing of the communications translator for a response from an ILEC to the order from the CLEC of FIG. 4.

Busines Rules Engine Flow -- FIG. 8

FIG. 8 depicts the operation of the business rules engine. The business rules engine 29 relies on lookup tables in the database 22 to perform the processing. Database 22 contains reference data in tables where in the table columns the "Item name" must match. The business rules engine 29 relies on lookup tables to direct

flow of a transaction based on BRE structure (destination, message type and version). By way of example, the database tables `wm_message_helper`, `wm_gw_info` and `extractor_helper` are used.

5

DESTINATION	MSG TYPE	MSG VERSION	PARSER OPTIONS	EXTRACTOR OPTIONS	CONVERTER OPTIONS	STRATEGY OPTIONS
4567	SD	V1-BAN	xlsr		xcompres	
4567	H	V1-BAN	xlsr		xcompres	
4567	A	V1-MASS	xlsr		xcompres	
4567	C	V1-MASS	xlsr		xcompres	
4567	D	V1-MASS	xlsr		xcompres	
4567	M	V1-MASS	xlsr		xcompres	
4567	T	V1-MASS	xlsr		xcompres	
4567	V	V1-MASS	xlsr		xcompres	
4567	H	V1-MASS	xlsr		xcompres	
7316	A	V1-MFS	xlsr		xcompres	
7316	C	V1-MFS	xlsr		xcompres	
7316	D	V1-MFS	xlsr		xcompres	

wm_message_helper_Table

wm_gw_info_Table

DESTINATION	MSG TYPE	MSG VERSION	DIRECTION	PROTO COL	IP ADDRESS	USER NAME	PASS-WORD	DESCRIPTION
ESP	H	V1-BAN	2	SMTP	SNET2	ilech	ilech	sending email
ESP	A	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	C	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	D	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	M	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	T	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	V	V1-MASS	2	SMTP	SNET2	ilech	ilech	sending email
ESP	A	V1-BAN	1	SMTP	SNET2	ilec	ilec	receiving email

extractor_info_Table

DESTINATION	MSG VERSION	MSG TYPE	SLEN/FE	SEQ	DETAIL
467	VER3	D	A	1	INFO_CONTACT, ENCLUSER, LINEDETAIL_LF, LINEDETAIL_G, DIRECTORY, DIRECTORY_Ht, DIRECTORY_Db, REMARKS
467	VER3	D	ATTP	2	TTP_INFO, TTP_CONTACT, TTP_ENCLUSER, TTP_LINEDETAIL_LF, TTP_REMARKS
8888	VI	RS	A	1	INFO_CONTACT, ENCLUSER, LINEDETAIL_LF, LINEDETAIL_G, DIRECTORY, DIRECTORY_Ht, DIRECTORY_Db, REMARKS
8888	VI	RS	ATTP	2	TTP_INFO, TTP_CONTACT, TTP_ENCLUSER, TTP_LINEDETAIL_LF, TTP_REMARKS
8888	VI	SD	A	1	INFO_CONTACT, ENCLUSER, LINEDETAIL_LF, LINEDETAIL_G, DIRECTORY, DIRECTORY_Ht, DIRECTORY_Db, REMARKS

Brief Example

In operation for a transaction, the CLEC 10-1 OF FIG. 2 sends an input service order to the communication translator 11 which has the form as shown in the following TABLE 1.

TABLE 1
CLEC Input Service Order

```
5
10      ORDER
      {
      IDINFO
        {RecVer=V2-MASS;
15        PON=N210113592001;
        PODate=19980224;
        DateSENT=19980224;
        TimeSent=1200;
        Action=C;
        Ver=;
20        CAN=;
        CCNA=ATX;
        DueDate=19980225;
        . . .
25        SvcOrder=1N2900308;
        }
        . . .
30      DIRECTORYDET
        {Listing=1;
        Action=C;
        SUP=;
35        CAN=;
        ListType=LML;
        YPPA=;
        WPSection=M;
        .
40        .
        .
        ListName=VEROCHO,M;
        ListAddr=135 Loomis Drive
        }
45      }
```

The TABLE 1 input service order is parsed by the parser 26 to form a parsed input service order having the form set forth in the following TABLE 2.

TABLE 2
Parsed Input Service Order

```
IDINFO|RecVer|V2-MASS
IDINFO|PON| N210113592001
IDINFO|PODate|19980209
IDINFO|DateSENT|19980209
IDINFO|TimeSent|1200
IDINFO|Action|V
IDINFO|Ver|1
IDINFO|CAN|
IDINFO|CCNA|ATX
IDINFO|DueDate|19980214
```

. . .

```
IDINFO|SvcOrder|1N2900308
```

. . .

```
DIRECTORY_Hdr|Listing|1
DIRECTORY_Hdr|Action|C
DIRECTORY_Hdr|SUP|
DIRECTORY_Hdr|CAN|
DIRECTORY_Hdr|ListType|LML
DIRECTORY_Hdr|YPPA|
```

. . .

```
DIRECTORY_Hdr|ListName|(NP-NSL) Rhodes,C
DIRECTORY_Hdr|ListAddr|2600 Red Oak Lane
DIRECTORY_Hdr|Copies|2
DIRECTORY_Hdr|PubOpt|3
DIRECTORY_Hdr|FaxInfo|
```

In the formatted CLEC parsed Input Service Order of TABLE 2 above, a Section is *IDINFO*, an Item is *Ver* and Data is 19980214 highlighted as follows:

```
IDINFO|RecVer|V2-MASS
IDINFO|PON| N210113592001
IDINFO|PODate|19980209
```

```

IDINFO|DateSENT|19980209
IDINFO|Action|V
IDINFO|Ver|1
IDINFO|CAN|
IDINFO|CCNA|ATX
IDINFO|DueDate|19980214

```

From the formatted CLEC parsed Input Service Record of TABLE 2 above, the **Version** *RecVer*, the **Message Type** *Action* and the **Destination** *LSP* are derived highlighted as follows:

```

IDINFO|RecVer|V2-MASS
IDINFO|PON|N210113592001
IDINFO|PODate|19980209
IDINFO|DateSENT|19980209
IDINFO|Action|V
IDINFO|Ver|1
IDINFO|CAN|
IDINFO|LSP|NAME|BAN
IDINFO|DueDate|19980214

```

The TABLE 2 parsed input service order is processed by the business rules engine 29 to form work orders. The functions of the BRE are to do format checking, content checking, business requirements, code translation and work order decomposition. Format checking is typically performed in the parser 26 but can be done in the business rules engine 29. Mercator is an edit facility that maps the data into an internal message and checks format characteristics.

Data content checking ensures that mandatory data fields such as "Telephone #" exist and that conditional fields have the necessary data needed. For example, if there is a foreign listing, there must be a book section and a directory book number. Business requirements are based on input record format and use of reference table lookups, complex logical constructs to create, update and verify information, have the ability to update one field based upon the information contained in another and the ability to create user-defined variables. Code translation changes input codes according to specific trading partner rules where for example a TCIF to USOC translation is, for example, "3WC = U3V ". Work order decomposition beaks

down a service order into the one or more work orders for different ones of the trading partner external systems 12 where work orders include common data, such as customer information, carried across all work orders and unique data that is particular to a specific trading partner.

5 The business rules engine 29 hierarchically classifies rules by *Destination*, *Type* and *Version* where structure is captured from input service records and internal tables from database 22. *Destination* is the final termination point of an order, that is to one of the trading partner external systems 12 (for example, EDI transaction for ILEC 12-1). *Type* is the classification of an output transaction and includes, for example, New, Change, Disconnect, Temporary Suspension, Inside
10 Move, Restore of Temporary Suspend, Seasonal Suspend and Restore, Outside Move, Migrate as Specified, preorder, order, repair & maintenance. *Version* is the level or standard applicable to the destination and message type and is, for example, based on jurisdiction, date, rate change or protocol (for example, EDI) can be version
15 dependent.

A rule is an evaluation process testing input against given criteria which may result in actions being performed. An abstract example of a rule is as follows:

“ . . . whenever a **directory listing** is ordered
without a **listing address**, then prevent the order
20 from going to the ILEC (that is, stop the
processing), and send out an appropriate **error**
message for investigation . . . ”

In the present example work order 1 and work order 2, have the form set forth in the following TABLE 3-1 and TABLE 3-2, respectively.

TABLE 3-1
Work Order 1

5	IDINFO PON N210113592001
	IDINFO PODate 19980209
	IDINFO DateSENT 19980209
	IDINFO TimeSent 1200
	IDINFO Action V
	IDINFO Ver 1
10	IDINFO CAN
	IDINFO CCNA ATX
	IDINFO DueDate 19980214
	. . .
15	IDINFO SvcOrder 1N2900308
	. . .
20	IDINFO WORK_ORDER_NUMBER N21011359914701
	. . .
	TPP_PRODUCT LF_CODE VMS001
	. . .
25	

TABLE 3-2
Work Order 2

30	IDINFO PON N210113592001
	IDINFO PODate 19980209
	IDINFO DateSENT 19980209
	IDINFO TimeSent 1200
	IDINFO Action V
35	IDINFO Ver 1
	IDINFO CAN
	IDINFO CCNA ATX
	IDINFO DueDate 19980214
40	. . .

The TABLE 3-1 and TABLE 3-2 work order 1 and work order 2 are formatted by the formatter 27 to an EDI format having the form set forth in the following TABLE 4-1 and TABLE 4-2, respectively.

45

TABLE 4-1
Formatted Work Order 1

	ISA^00^	^00^
5	^ZZ^7729	^ZZ^9147
	^980225^1616^U^00303^100000050^1^T^>	
	G S ^ P O ^ E . G A T E W A Y ^ S N E T	
	CLEC^980225^1616^100000050^X^003050	
	ST^850^0037	
10	BEG^00^SS^N210113592001^^980209	
	REF^12^2035678976	
	REF^AQ^D	
	REF^WO^A67890342999994545678	
15	P E R ^ O C ^ K e l l y	
	Jones^TE^2123957712^FX^2123950606^EM	
	^Kjones	
	P E R ^ C N ^ M a r y	
	Boswel^TE^8887867534^EM^Mscott^EX^Mo	
	rt Scott	
20	. . .	
	N1^DH^(NP-NSL) Rhodes,C	
	N3^2600 Red Oak Lane	
	N1^DA^H. Hilker	
	N3^16 Decatur Avenue NY NY 99999	
25	PO1^3^1^EA^^SH^LAL	
	SI^TI^SA^A^TN^7187960909^CL^R^LX^718	
	7960909^^EX^XBX^LE^1	
	. . .	

TABLE 4-2
Formatted Work Order 2

5	ISA^00^ ^00^
	^ZZ^7729
	^ZZ^9147
	^980225^1616^U^00303^100
	000050
	^1^T^>
10	GS^PO^E.GATEWAY^SNET
	CLEC^980225^1616^1000000
	50^X^0
	03050
	ST^850^0037
15	BEG^00^SS^N210113592001^
	^98020
	9
	REF^12^2035678976
	REF^AQ^D
20	REF^WO^A6789034299994545
	678
	PER^OC^Kelly
	Jones^TE^2123957712^FX^2
	123950
25	606^EM^Kjones
	P E R ^ C N ^ M a r y
	Boswel^TE^8887867534^EM^
	Mscott
30	^EX^Mort Scott

The TABLE 4-1 and TABLE 4-2 formatted work order 1 and work order 2 are forwarded using the EDI protocol 17-1 to different ones of the external systems.

35 Detailed Example

A detailed example of the processing of a transaction, in which an order placed from the CLEC internal system 10-1 to the external ILEC system 12-1, is shown in the following LISTING 1, LISTING 2, LISTING 3 and LISTING 4. LISTING 1 depicts, with reference to FIG. 3, the order output from the CLEC system 10-1 that is connected by the CLEC system gateway 14-1 to the parser 26 in communication translator 11. LISTING 2 depicts the output from the parser 26 that is stored in the active message queue 28 for processing by the business rules

engine 29. LISTING 3 depicts the processed messages, after processing by the business rules engine, that are input to the formatter 27. LISTING 4 depicts the formatted messages from formatter 27 that are use the EDI protocol and that are input to the external ILEC system 12-1.

5

LISTING 1
(Input Order From CLEC System)

```

ORDER{
IDINFO{RecVer=U1-BAN;PON=MMXxYyZz3388;PODate=19980831;DateSENT=19980831;TimeSent=1130;
Action=U;Ver=;CAN=;CCNA=TPM;DueDate=19981122;DueTime=1200;Dispatch=Y;Access=;SucOrder=;
RPOH=;OCN_RCU=4567;OCN_SEND=7125;Priority=;SIC=9876;DDOut=;AFO=RESALE, Loop;}
REMARKS{Remarks=This file is testing hunting, multiple fids, and other new tags ;Remarks
-I am trying to utilize all new data elements.;Remarks=We are testing 1.4 version.;}
CONTACT{Name=Linda Rep;Tel=666-666-6662;Fax=444-444-4444;CLECrepEM=;ImpName=John
Rep2;ImpTel=888-888-8888;ExpApprv=;ILECrepEM=;}
ENDUSER{Change=Y;SUP=;BAN=215-675-1234;FromEUBAN=212-298-1000;ToEUBAN=212-298-1000;
Name=Peter Gerrity;ListAddress=10 Merrit Street;ServAddress=10 Merrit Street;Building=;
Floor=PH;Room=;City=New York;State=NY;Zip=10036;CCName=;CTel=;OldServAddress=;
EUMI=;SSN=865-23-1234;}
HUNTING{HA=A;HNTYP=5;HUNTSEQ=;HUNT_ID=80TH;HML=0400;TLI=212-298-1000;}
HUNT_SERVICE_DETAILS{TN=212-298-1000;TN=212-298-1001;TN=212-298-1002;TN=212-298-1003;
TN=212-298-1004;TN=212-298-1005;TN=212-298-1006;TN=;TN=;TER=0001;TER=0002;TER=0003;
TER=0004;TER=0005;TER=0006;TER=0007;TER=;TER=;TER=;}
LINEDETAIL{LD{Line=1;Action=U;Supaction=;Canaction=;TN=2122981001;PBXTer=;Freeze=;
LPIC=8856;PIC=0608;RefCallInd=;TMC=;JKCode=;JKStat=;JKPos=;JKNum=;BA=D;Block=H;TSP=
TSP12345C-E1;OTN=;SGL=;PULSE=;};LF{Action=A;Code=CFW001;FIDdata1=2122980016;FIDdata2=2;
FIDdata3=5;FIDdata4=;FIDdata5=;};LF{Action=A;Code=ACR002;FIDdata1=;FIDdata2=;FIDdata3=;
FIDdata4=;FIDdata5=;};LF{Action=A;Code=CFW002;FIDdata1=2124561234;FIDdata2=8;FIDdata3=;
FIDdata4=;FIDdata5=;};}
LINEDETAIL{LD{Line=2;Action=U;Supaction=;Canaction=;TN=2122981002;PBXTer=;Freeze=C;
LPIC=0680;PIC=0608;RefCallInd=;TMC=;JKCode=;JKStat=;JKPos=;JKNum=;BA=A;Block=C;TSP=
TSP12345C-E1;OTN=;SGL=;PULSE=;};LF{Action=A;Code=CFW038;FIDdata1=;FIDdata2=;FIDdata3=;
FIDdata4=;FIDdata5=;};LF{Action=C;Code=CFW002;FIDdata1=2126666666;FIDdata2=8;FIDdata3=;
FIDdata4=;FIDdata5=;};LF{Action=A;Code=CSC004;FIDdata1=;FIDdata2=;FIDdata3=;FIDdata4=;
FIDdata5=;};}
LINEDETAIL{LD{Line=3;Action=U;Supaction=;Canaction=;TN=2122981003;PBXTer=;Freeze=E;
LPIC=0688;PIC=none;RefCallInd=;TMC=;JKCode=;JKStat=;JKPos=;JKNum=;BA=A;Block=L;TSP=
TSP12345C-E1;OTN=;SGL=;PULSE=;};LF{Action=D;Code=3WC;FIDdata1=;FIDdata2=;FIDdata3=;
FIDdata4=;FIDdata5=;};LF{Action=A;Code=VMS001;FIDdata1=;FIDdata2=;FIDdata3=;FIDdata4=;
FIDdata5=;};}
LINEDETAIL{LD{Line=4;Action=U;Supaction=;Canaction=;TN=2122981004;PBXTer=;Freeze=E;
LPIC=0688;PIC=0688;RefCallInd=;TMC=;JKCode=;JKStat=;JKPos=;JKNum=;BA=A;Block=L;TSP=
TSP12345C-E1;OTN=;SGL=;PULSE=;};LF{Action=A;Code=CFW002;FIDdata1=2124561234;FIDdata2=8;
FIDdata3=;FIDdata4=;FIDdata5=;};LF{Action=A;Code=SCG008;FIDdata1=;FIDdata2=;FIDdata3=;

```

LISTING 1
(Input Order From CLEC System)

```

FIDData4=;FIDData5=;};LF{Action=A;Code=JK;FIDData1=;FIDData2=;FIDData3=;FIDData4=;FID
Data5=;};LF{Action=C;Code=IWT;FIDData1=;FIDData2=;FIDData3=;FIDData4=;FIDData5=;};}
DIRECTORYHDR{IndexTN=212-298-1000;Change=Y;CS=R;Exchange=BB;VPHeading=;DelivAddr=2
Circle Lane YORKTOWN, NY;DelivInstr=BW;VPAdvt=Y;Contact=Tom Hill;Tel=2124561256;Ext=56;}
DIRECTORYDET{Listing=1;Action=A;SUP=;CAN=;ListType=LML;YPPA=5678;WPSection=LC;DueDate=
20000102;ListTel=2122981000;Placement=;Caption=;ListName=Gerrity, Peter;ListAddr=10 Merrit
Street;Copies=2;PubOpt=1;FaxInfo=Testing a new CLEC file;FaxPages=5;DDDCd=7;}
DIRECTORYDET{Listing=2;Action=A;SUP=;CAN=;ListType=LAL;YPPA=67894;WPSection=LC;DueDate=
19981001;ListTel=9149215671;Placement=;Caption=;ListName=Gerrity, Tom;ListAddr=10 Merrit
Street;Copies=;PubOpt=;FaxInfo=;FaxPages=;DDDCd=;}
DIRECTORYDET{Listing=3;Action=U;SUP=;CAN=;ListType=LAL;YPPA=67894;WPSection=;DueDate=
19981001;ListTel=2122981000;Placement=;Caption=;ListName=Gerrity, Dawn;ListAddr=10 Merrit
Street;Copies=;PubOpt=;FaxInfo=;FaxPages=;DDDCd=;}
)

```

LISTING 2

(Parsed Messages Stored In Active Message Queue)

§START
Section|IDINFO|
Item|RecVer|U1-BAN
Item|PON|NWwXyYzZ3308
Item|WON|
Item|PODate|19980831
Item|DateSENT|19980831
Item|TimeSent|1130
Item|Action|U
Item|Uer|
Item|CAN|
Item|CCNA|TPM
Item|DueDate|19981122
Item|DueTime|1200
Item|Dispatch|Y
Item|Access|
Item|SvcOrder|
Item|RPON|
Item|OCN_RCU|4567
Item|OCN_SEND|7125
Item|Priority|
Item|SIC|9876
Item|DDOut|
Item|LSPName|
Item|AFO|RESALE, Loop
Section|REMARKS|
Item|Remark|This file is testing hunting, multiple fids, and other new tags
Item|Remark|I am trying to utilize all new data elements.
Item|Remark|We are testing 1.4 patch. Fix.
Section|CONTACT|
Item|Name|Linda Rep
Item|Tel|666-666-6662
Item|Fax|444-444-4444
Item|CLECrepEM|
Item|ImpName|John Rep2
Item|ImpTel|888-888-8888
Item|Expprv|

LISTING 2

(Parsed Messages Stored In Active Message Queue)

```

Section|ENDUSER|
Item|Change|Y
Item|SUP|
Item|BAN|215-675-1234
Item|FromEUBAN|212-298-1000
Item|ToEUBAN|212-298-1000
Item|Name|Peter Gerrity
Item|ListAddress|10 Merrit Street
Item|ServAddress|10 Merrit Street
Item|Building|
Item|Floor|PH
Item|Room|
Item|City|New York
Item|State|NY
Item|Zip|10036
Item|CCName|
Item|CCTel|
Item|OldServAddress|
Item|EUMI|
Item|SSN|865-23-1234
Section|HUNTING|
Item|HA|A
Item|HNTYP|5
Item|HUNTSEQ|
Item|HUNT_ID|BOTH
Item|HML|0400
Item|TLI|212-298-1000
Section|HUNT_SERVICE_DETAILS|
Item|TN|212-298-1000
Item|TN|212-298-1001
Item|TN|212-298-1002
Item|TN|212-298-1003
Item|TN|212-298-1004
Item|TN|212-298-1005
Item|TN|212-298-1006
Item|TER|0001
Item|TER|0002

```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```

Item|TER|0003
Item|TER|0004
Item|TER|0005
Item|TER|0006
Item|TER|0007
Section|LINEDETAIL_LF|
Item|Line|1
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981001
Item|PBXTer|
Item|Freeze|
Item|LPIC|8856
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
Item|Block|H
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|CFW001
Item|LF_FIDData1|2122988816
Item|LF_FIDData2|2
Item|LF_FIDData3|5
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|1
Item|Action|U
.....

```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```

Item|Supaction|
Item|Canaction|
Item|TN|2122981001
Item|PBXTer|
Item|Freeze|
Item|LPIC|8856
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNun|
Item|BA|D
Item|Block|H
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGHL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|ACR002
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|1
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981001
Item|PBXTer|
Item|Freeze|
Item|LPIC|8856
Item|PIC|0688
Item|RefCallInd|

```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```

Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
Item|Block|H
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGML|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|CFW002
Item|LF_FIDData1|2124561234
Item|LF_FIDData2|8
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|2
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981002
Item|PBXTer|
Item|Freeze|C
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|C
Item|TSP|TSP12345C-E1

```

LISTING 2

(Parsed Messages Stored In Active Message Queue)

```
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|CFW038
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|2
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981002
Item|PBXTer|
Item|Freeze|C
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKHum|
Item|BA|A
Item|Block|C
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|C
Item|LF_Code|CFW002
Item|LF_FIDData1|2126666666
Item|LF_FIDData2|8
Item|LF_FIDData3|
```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|2
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981002
Item|PBXTer|
Item|Freeze|C
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|C
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|CSC004
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|3
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981003
```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|none
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP| TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|D
Item|LF_Code|3WC
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|3
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981083
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|none
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
```

LISTING 2

(Parsed Messages Stored In Active Message Queue)

```

Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|VMS001
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|4
Item|Action|V
Item|Supaction|
Item|Canaction|
Item|TN|2122981004
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|

```


LISTING 2
(Parsed Messages Stored In Active Message Queue)

```
Item|LF_Action|A
Item|LF_Code|CFW002
Item|LF_FIDData1|2124561234
Item|LF_FIDData2|8
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|4
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981004
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|SCG008
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```
Item|Line|4
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981004
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|A
Item|LF_Code|JK
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|4
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981004
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
.....
```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```

Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat||
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|C
Item|LF_Code|IWT
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|5
Item|Action|A
Item|Supaction|
Item|Canaction|
Item|TN|2122981005
Item|PBXTer|
Item|Freeze|E
Item|LPIC|3766
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A

```

LISTING 2

(Parsed Messages Stored In Active Message Queue)

```

Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|LINEDETAIL_LF|
Item|Line|6
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981006
Item|PBXTer|
Item|Freeze|E
Item|LPIC|none
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Item|LF_Action|C
Item|LF_Code|CID006
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|7
Item|Action|U

```

LISTING 2
(Parsed Messages Stored In Active Message Queue)

```

Item|Supaction|
Item|Canaction|
Item|TN|2122981007
Item|PBXTer|
Item|Freeze|E
Item|LPIC|none
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
Item|Block|C
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|DIRECTORY_Hdr|
Item|IndexTN|212-298-1000
Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdvt|Y
Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|1
Item|Action|A
Item|SUP|
Item|CAN|
Item|ListType|LML
Item|YPPA|5678

```

LISTING 2

(Parsed Messages Stored In Active Message Queue)

```
Item|WPSection|LC
Item|DueDate|20000102
Item|ListTel|2122981000
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Peter
Item|ListAddr|10 Merrit Street
Item|Copies|2
Item|PubOpt|1
Item|FaxInfo|Testing a new CLEC file
Item|FaxPages|5
Item|DDDCd|7
Section|DIRECTORY_Hdr|
Item|IndexTN|212-298-1000
Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdvt|Y
Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|2
Item|Action|A
Item|SUP|
Item|CAN|
Item|ListType|LAL
Item|YPPA|67894
Item|WPSection|LC
Item|DueDate|19981001
Item|ListTel|9149215671
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Tom
Item|ListAddr|10 Merrit Street
```

LISTING 2**(Parsed Messages Stored In Active Message Queue)**

Item|Copies|
Item|PubOpt|
Item|FaxInfo|
Item|FaxPages|
Item|DDDCd|
Section|DIRECTORY_Hdr|
Item|IndexTH|212-298-1000
Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdvt|Y
Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|3
Item|Action|U
Item|SUP|
Item|CAN|
Item|ListType|LAL
Item|YPPA|67894
Item|WPSection|
Item|DueDate|19981001
Item|ListTel|2122981000
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Dawn
Item|ListAddr|10 Merrit Street
Item|Copies|
Item|PubOpt|
Item|FaxInfo|
Item|FaxPages|
Item|DDDCd|

LISTING 3
(Input To Formatter)

```
$START
Section|IDINFO|
Item|RecVer|U1-BAN
Item|PON|NWwXxYyZz3308
Item|WON|
Item|PODate|19980831
Item|DateSENT|19980831
Item|TimeSent|1130
Item|Action|U
Item|Ver|
Item|CAN|
Item|CCNA|TPH
Item|DueDate|19981122
Item|DueTime|1200
Item|Dispatch|Y
Item|Access|
Item|SucOrder|
Item|RPON|
Item|OCN_RCU|4567
Item|OCN_SEND|7125
Item|Priority|
Item|SIC|9876
Item|DDOut|
Item|LSPName|
Item|AFO|RESALE, Loop
Section|REMARKS|
Item|Remark|This file is testing hunting, multiple fids, and other new tags
Item|Remark|I am trying to utilize all new data elements.
Item|Remark|We are testing 1.4 patch. Fix.
Section|CONTACT|
Item|Name|Linda Rep
Item|Tel|666-666-6662
Item|Fax|444-444-4444
Item|CLECrepEM|
Item|ImpName|John Rep2
Item|ImpTel|888-888-8888
Item|Expprv|
```


LISTING 3
(Input To Formatter)

```
Item|TER|0002
Item|TER|0003
Item|TER|0004
Item|TER|0005
Item|TER|0006
Item|TER|0007
Section|LINEDETAIL_LF|
Item|Line|1
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981001
Item|PBXTer|
Item|Freeze|
Item|LPIC|8856
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
Item|Block|H
Item|TSP|TSP12345C-E1
Item|OTH|
Item|SGNL|
Item|PULSE|
Section|LF|
Item|LF_Action|A
Item|LF_Code|CFW001
Item|LF_FIDData1|2122988816
Item|LF_FIDData2|2
Item|LF_FIDData3|5
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
```

LISTING 3
(Input To Formatter)

```
Item|TER|0002
Item|TER|0003
Item|TER|0004
Item|TER|0005
Item|TER|0006
Item|TER|0007
Section|LINEDETAIL_LF|
Item|Line|1
Item|Action|V
Item|Supaction|
Item|Canaction|
Item|TN|2122981001
Item|PBXTer|
Item|Freeze|
Item|LPIC|8856
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
Item|Block|H
Item|TSP|TSP12345C-E1
Item|OTH|
Item|SGNL|
Item|PULSE|
Section|LF|
Item|LF_Action|A
Item|LF_Code|CFW001
Item|LF_FIDData1|2122988816
Item|LF_FIDData2|2
Item|LF_FIDData3|5
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
```

LISTING-3
(Input To Formatter)

```
Item|LF_Action|A
Item|LF_Code|ACR002
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|A
Item|LF_Code|CFW002
Item|LF_FIDData1|2124561234
Item|LF_FIDData2|8
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|2
Item|Action|V
Item|Supaction|
Item|Canaction|
Item|TN|2122981002
Item|PBXTer|
Item|Freeze|C
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|C
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
```

LISTING 3
(Input To Formatter)

```
Section|LF|
Item|LF_Action|A
Item|LF_Code|CFW038
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|C
Item|LF_Code|CFW002
Item|LF_FIDData1|2126666666
Item|LF_FIDData2|8
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|A
Item|LF_Code|CSC004
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|3
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981003
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|none
Item|RefCallInd|
Item|TNC|
Item|JKCode|
```

LISTING 3
(Input To Formatter)

```
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP| TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|LF|
Item|LF_Action|D
Item|LF_Code|3WC
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|A
Item|LF_Code|VMS001
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|4
Item|Action|V
Item|Supaction|
Item|Canaction|
Item|TN|2122981004
Item|PBXTer|
Item|Freeze|E
Item|LPIC|0688
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
```

LISTING 3
(Input To Formatter)

```
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|LF|
Item|LF_Action|A
Item|LF_Code|CFW002
Item|LF_FIDData1|2124561234
Item|LF_FIDData2|8
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|A
Item|LF_Code|SCG008
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|A
Item|LF_Code|JK
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LF|
Item|LF_Action|C
Item|LF_Code|IWT
```

LISTING 3
(Input To Formatter)

```
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|5
Item|Action|A
Item|Supaction|
Item|Canaction|
Item|TN|2122981005
Item|PBXTer|
Item|Freeze|E
Item|LPIC|3766
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|LINEDETAIL_LF|
Item|Line|6
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981006
Item|PBXTer|
Item|Freeze|E
Item|LPIC|none
Item|PIC|0688
```

LISTING 3
(Input To Formatter)

```
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|A
Item|Block|L
Item|TSP|TSP12345G-E1
Item|OTH|
Item|SGNL|
Item|PULSE|
Section|LF|
Item|LF_Action|C
Item|LF_Code|CID006
Item|LF_FIDData1|
Item|LF_FIDData2|
Item|LF_FIDData3|
Item|LF_FIDData4|
Item|LF_FIDData5|
Section|LINEDETAIL_LF|
Item|Line|7
Item|Action|U
Item|Supaction|
Item|Canaction|
Item|TN|2122981007
Item|PBXTer|
Item|Freeze|E
Item|LPIC|none
Item|PIC|0688
Item|RefCallInd|
Item|TNC|
Item|JKCode|
Item|JKStat|
Item|JKPos|
Item|JKNum|
Item|BA|D
```


LISTING-3
(Input To Formatter)

Item|Block|C
Item|TSP|TSP12345C-E1
Item|OTN|
Item|SGNL|
Item|PULSE|
Section|DIRECTORY|
Item|IndexTN|212-298-1000
Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdv|Y
Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|1
Item|Action|A
Item|SUP|
Item|CAN|
Item|ListType|LML
Item|YPPA|5678
Item|WPSection|LC
Item|DueDate|20000102
Item|ListTel|2122981000
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Peter
Item|ListAddr|10 Merrit Street
Item|Copies|2
Item|PubOpt|1
Item|FaxInfo|Testing a new CLEC file
Item|FaxPages|5
Item|DDDcd|7
Section|DIRECTORY|
Item|IndexTN|212-298-1000

LISTING 3
(Input To Formatter)

Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdvt|Y
Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|2
Item|Action|A
Item|SUP|
Item|CAN|
Item|ListType|LAL
Item|YPPA|67894
Item|WPSection|LC
Item|DueDate|19981001
Item|ListTel|9149215671
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Tom
Item|ListAddr|10 Herrit Street
Item|Copies|
Item|PubOpt|
Item|FaxInfo|
Item|FaxPages|
Item|DDDcd|
Section|DIRECTORY|
Item|IndexTN|212-298-1000
Item|Change|Y
Item|CS|R
Item|Exchange|BB
Item|YPHeading|
Item|DelivAddr|2 Circle Lane YORKTOWN, NY
Item|DelivInstr|BW
Item|YPAdvt|Y

LISTING-3
(Input To Formatter)

Item|Contact|Tom Hill
Item|Tel|2124561256
Item|Ext|56
Item|Listing|3
Item|Action|U
Item|SUP|
Item|CAN|
Item|ListType|LAL
Item|YPPA|67894
Item|WPSection|
Item|DueDate|19981001
Item|ListTel|2122981000
Item|Placement|
Item|Caption|
Item|ListName|Gerrity, Dawn
Item|ListAddr|10 Merrit Street
Item|Copies|
Item|PubOpt|
Item|FaxInfo|
Item|FaxPages|
Item|DDDcd|

LISTING 4
(Output To ILEC)

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 GS^PO^E-GATEWAY^SNET CLEC^19981123^1556^243^X^003050
 ST^850^0044
 BEG^00^SS^NWwXxYyZz3308^^19980831
 REF^12^2156751234
 REF^SC^9876
 REF^SY^865-23-1234
 REF^GP^TSP12345C-E1
 PER^OC^Linda Rep^TE^6666666662^FX^4444444444
 PER^CN^John Rep2^TE^8888888888
 DTM^150^^1200^^D8^19981122
 DTM^097^19980831^1130^ET^19
 SI^TI^AA^V^BN^2122981000^BO^2122981000
 PID^S^^TI^AA^^SO-RSQ^Y
 PID^S^^TI^AB^^SO-RSQ^Y
 PID^S^^TI^AC^^SO-RSQ^Y
 PID^S^^TI^AE^^SO-RSQ^Y
 PID^S^^TI^AF^^SO-RSQ^N

 N1^BT^^42^7125
 N1^78^^91^TPM
 N1^IT^Peter Gerrity
 N3^10 Merriit Street
 N4^New York^NY^10036
 NX2^32^PH
 PO1^1^1^EA
 SI^TI^SA^A^TN^2122981000^SF^HTY004^FD^0400
 SLN^1^^A^1^EA

LISTING 4
(Output To ILEC)

SI^TI^SA^A^T5^0001^TN^2122981000
SLN^2^^A^1^EA
SI^TI^SA^A^T5^0002^TN^2122981001
SLN^3^^A^1^EA
SI^TI^SA^A^T5^0003^TN^2122981002
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SI^TI^SA^V
N1^P9^^41^0688
N1^8V^^41^8856
SLN^1
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SLN^1
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SLN^1
SI^TI^SA^A^TN^2122981001^SF^CFW002^FD^2124561234^FD^8
PO1^3^1^EA
SI^TI^SA^V
N1^P9^^41^0688
N1^8V^^41^0688
SLN^1

LISTING 4
(Output To ILEC)

SI^TI^SA^V^TN^2122981002^FZ^C^TB^C^BB^A
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SI^TI^SA^C^TN^2122981002^SF^CFW002^FD^2126666666^FD^8
SLN^1
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PO1^4^1^EA
SI^TI^SA^V
N1^P9^^41^none
N1^8V^^41^0688
SLN^1
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SLN^1
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PO1^5^1^EA
SI^TI^SA^V
N1^P9^^41^0688
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SLN^1
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SLN^1
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SLN^1
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SLN^1

LISTING 4
(Output To ILEC)

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N1^8V^^41^3766
SLN^1
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N1^P9^^41^0688
N1^8V^^41^none
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SLN^1
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PO1^8^1^EA
SI^TI^SA^V
N1^P9^^41^0688
N1^8V^^41^none
SLN^1
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PO1^9^1^EA^^SH^LML
SI^TI^SA^A^TN^2122981000^CL^R^LX^2122981000^SB^LC^EX^BB^LE^1^TV^7
PWK^DI^FX^5^^^^Testing a new CLEC file
PWK^DI^BW^2^^DB^5678
DTM^007^^^^D8^20000102
SLN^1
N1^DH^Gerrity, Peter
N3^10 Merrit Street
N1^DA^Tom Hill

LISTING 4
(Output To ILEC)

N3^2 Circle Lane YORKTOWN, NY
PO1^10^1^EA^^SH^LAL
SI^TI^SA^A^TN^9149215671^CL^R^LX^2122981000^SB^LC^EX^BB
PWK^DI^BW^^DB^67894
DTM^007^^^^D8^19981001
SLN^1
N1^DH^Gerrity, Tom
N3^10 Merrit Street
N1^DA^Tom Hill
N3^2 Circle Lane YORKTOWN, NY
PO1^11^1^EA^^SH^LAL
SI^TI^SA^V^TN^2122981000^CL^R^LX^2122981000^^EX^BB
PWK^DI^BW^^DB^67894
DTM^007^^^^D8^19981001
SLN^1
N1^DH^Gerrity, Dawn
N3^10 Merrit Street
N1^DA^Tom Hill
N3^2 Circle Lane YORKTOWN, NY
CTT^11
SE^140^0044
GE^1^243
IEA^1^000010044

LISTING 4
(Output To ILEC)

While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that the foregoing and other changes in form and details may be made therein without departing from the scope of the invention.

CLAIMS

1 1 (Original). In a network formed of one or more first systems and one or more
2 second systems operating with messages to implement transactions, said first systems
3 operating with first messages having first forms and said second systems operating with
4 second messages having second forms, a communication translator comprising:

5 active message means for processing active ones of said messages including,
6 a parser for parsing said active ones of said messages into message
7 objects that are independent of said first and said second forms,
8 a rules engine for processing said message objects using rules to form
9 processed message objects,
10 a formatter for formatting said processed message objects,
11 a manager for controlling a flow of said first messages, said second messages
12 and said message objects to cause messages to be translated between
13 said first and second forms whereby transactions are communicated
14 between said first systems and said second systems.

1 2 (Original). In the network of Claim 1 wherein said communication translator
2 includes a first gateway for transferring said first messages between said first system and
3 said communication translator and includes a second gateway for transferring said
4 second messages between said second system and said communication translator.

1 3 (Original). In the network of Claim 1 wherein said communication translator
2 includes a fallout manager for processing messages that are not automatically
3 communicated between said first and second systems.

1 4 (Original). In the network of Claim 1 wherein said communication translator
2 includes a status manager for reporting the status of the flow of messages and of
3 transactions.

1 5 (Original). In the network of Claim 1 wherein said communication translator
2 includes graphical user interface means for providing user control of the communication
3 translator.

1 6 (Original). In the network of Claim 1 wherein said manager controls the flow
2 of said first messages and said second messages asynchronously.

1 7 (Original). In the network of Claim 1 wherein said first systems include a
2 CLEC system and said second systems include an ILEC system.

1 8 (Original). In the network of Claim 1 wherein said second systems include an
2 ILEC system and include one or more other systems as trading partner systems.

1 9 (Original). In the network of Claim 1 wherein said first systems include a
2 CLEC system and said second systems include an ILEC system and said transaction is
3 a local service request from the CLEC to the ILEC.

1 10 (Original). In the network of Claim 1 wherein said first systems include a
2 CLEC system and said second systems include an ILEC system and said transaction is
3 an access service request from the CLEC to the ILEC.

1 11 (Original). In the network of Claim 1 wherein said first systems include a
2 CLEC system and said second systems include an E911 system.

1 12 (Original). In the network of Claim 1 wherein said first systems include a
2 CLEC system and said second systems include a directory service system.

1 13 (Original). In the network of Claim 1 wherein said rules are defined by a
2 series of *conditions* and *actions* where the *actions* are performed if the *conditions* are
3 met.

1 14 (Original). In the network of Claim 1 wherein said communication translator
2 includes graphical user interface means for providing user communications to the
3 communication translator and wherein said graphical user interface means is operative
4 to update said active message means and said manager under user control without need
5 for program coding by such user.

1 15 (Original). In a network formed of one or more first systems and one or more
2 second systems operating with messages to implement transactions, said first systems
3 operating with first messages having first forms and said second systems operating with
4 second messages having second forms, a communication translation method comprising:
5 processing active ones of said messages including,
6 parsing said active ones of said messages into message objects that are
7 independent of said first and said second forms,
8 processing said message objects with rules to form processed message
9 objects,
10 formatting said processed message objects,

11 controlling a flow of said first messages, said second messages and said
12 message objects to cause messages to be translated between said first
13 and second forms whereby transactions are communicated between said
14 first systems and said second systems.

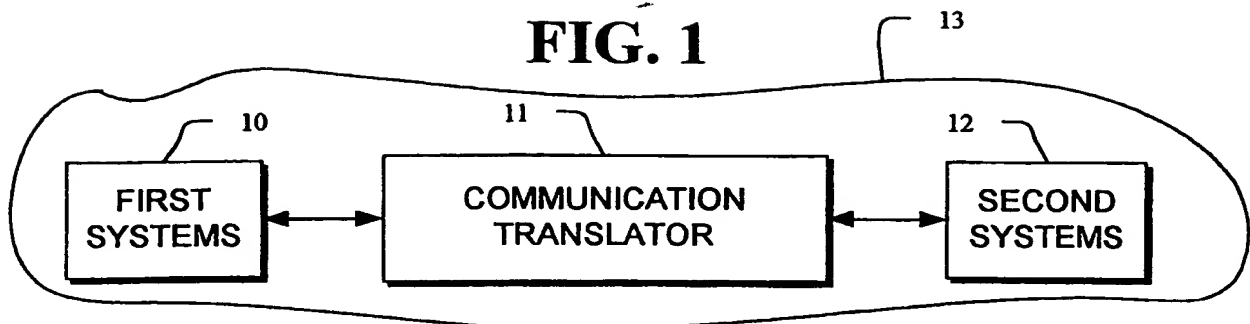
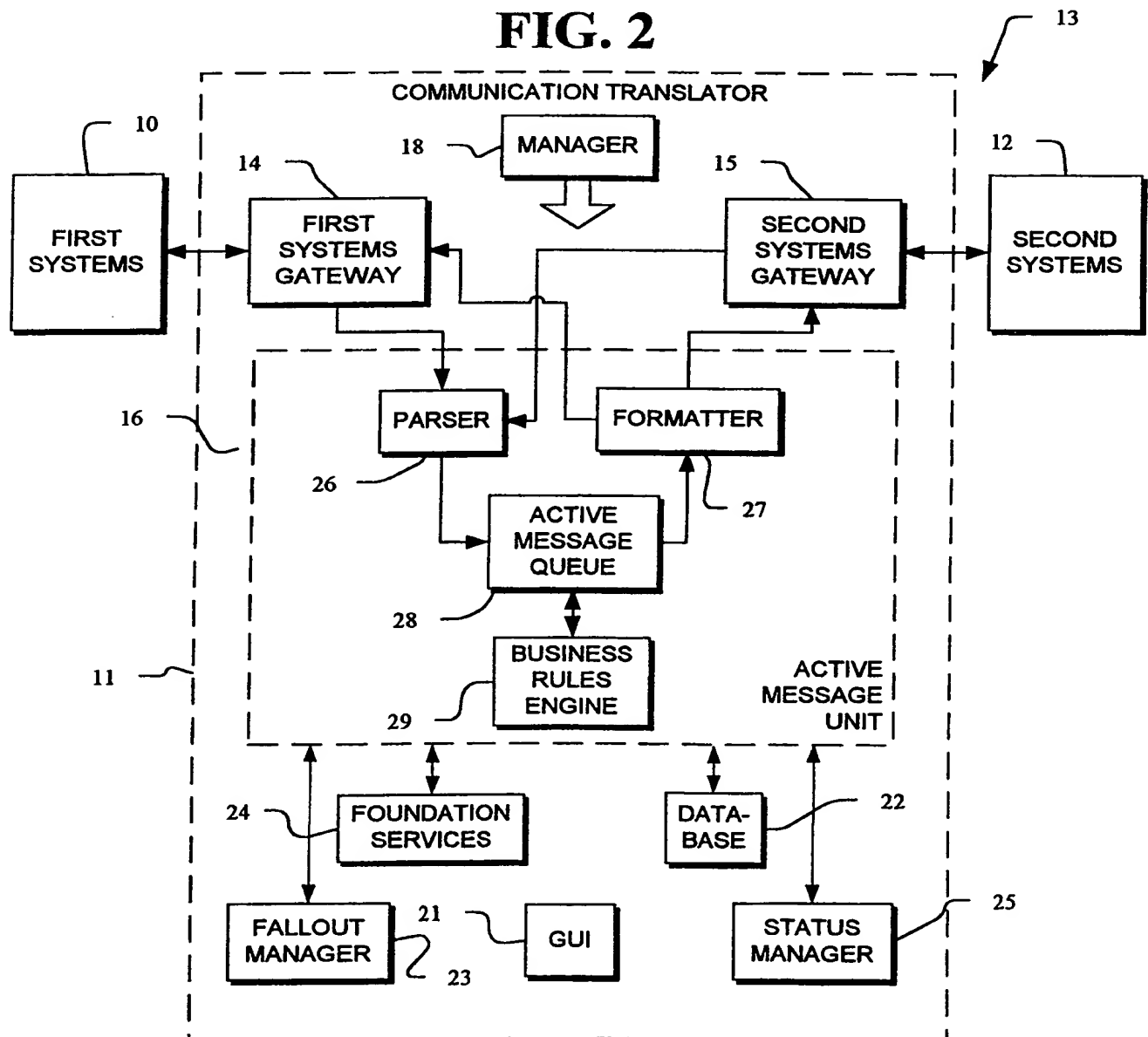
FIG. 1**FIG. 2**

FIG. 3

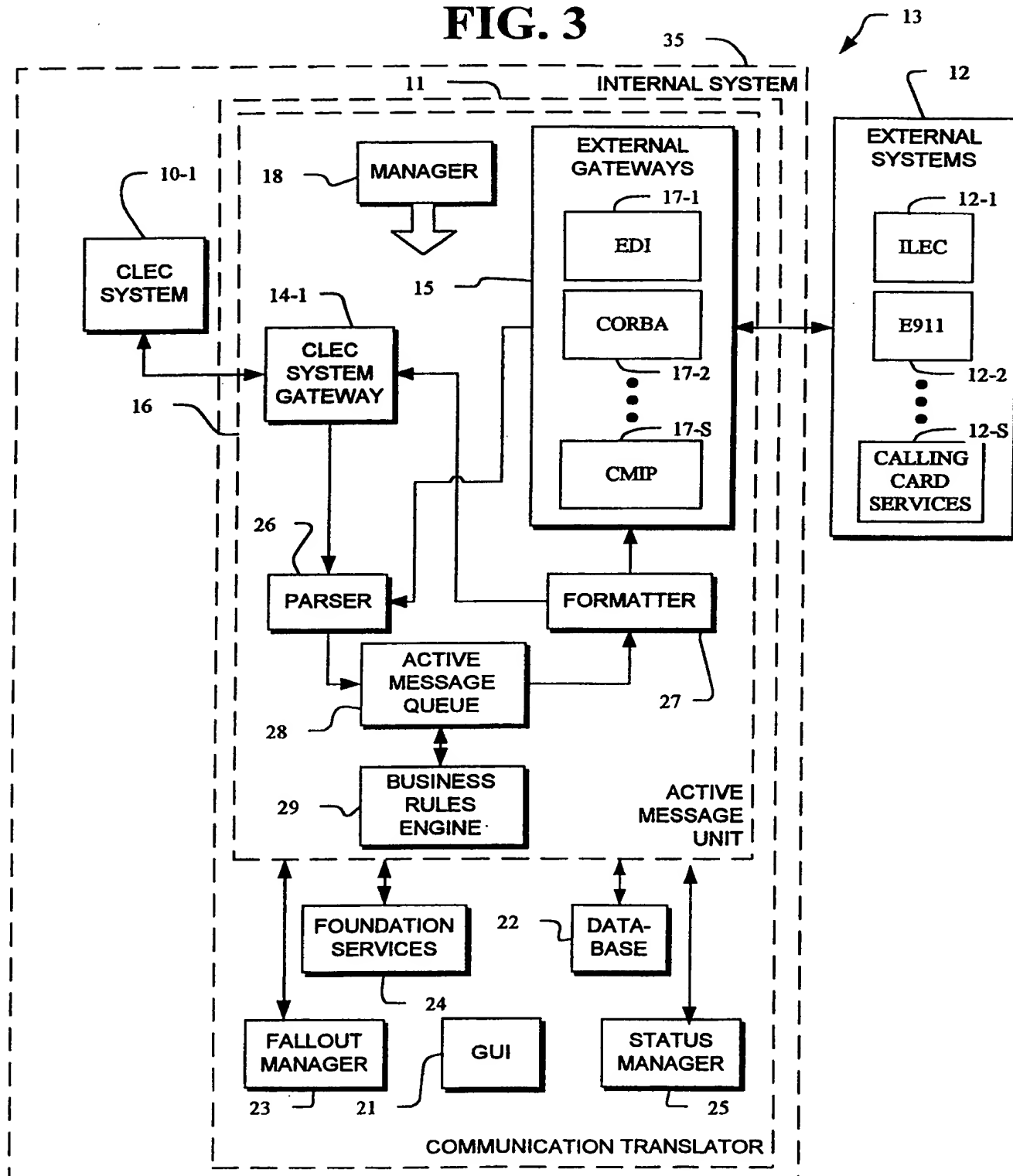


FIG. 4

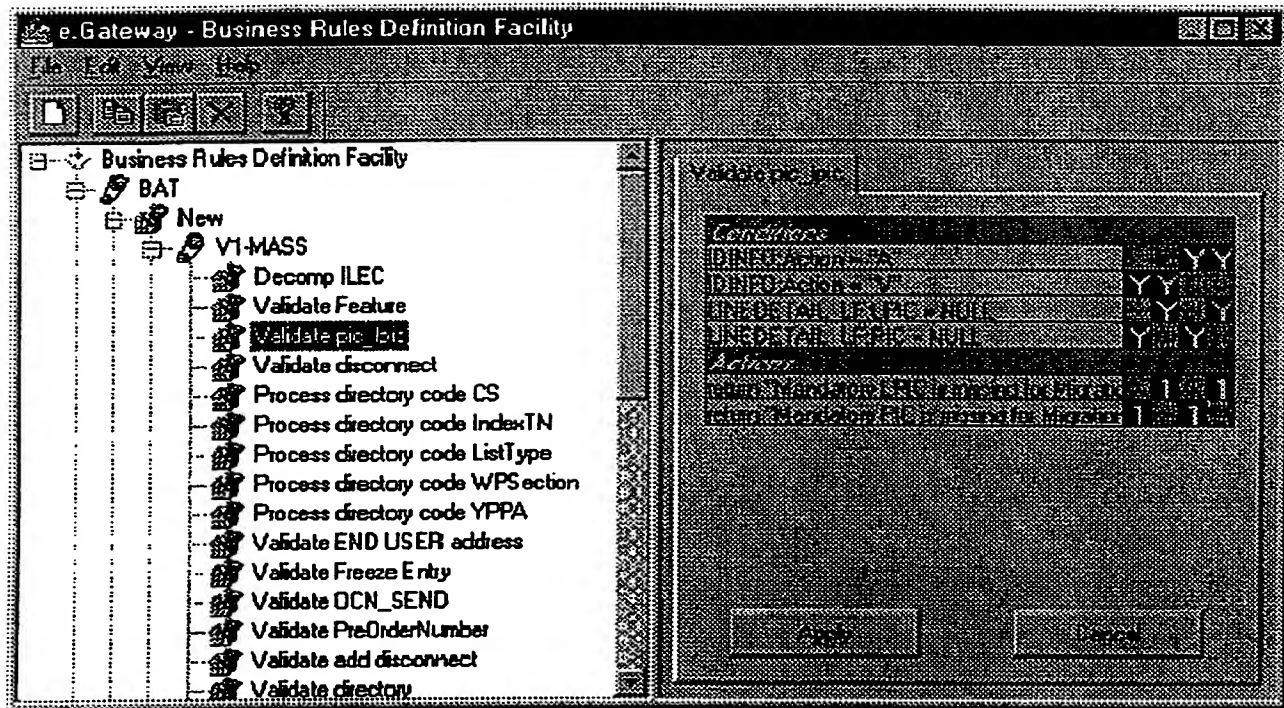


FIG. 5

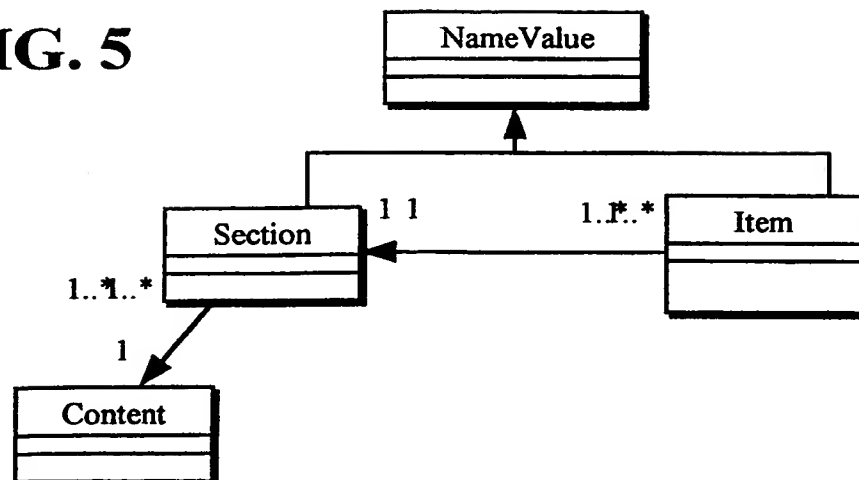


FIG. 6

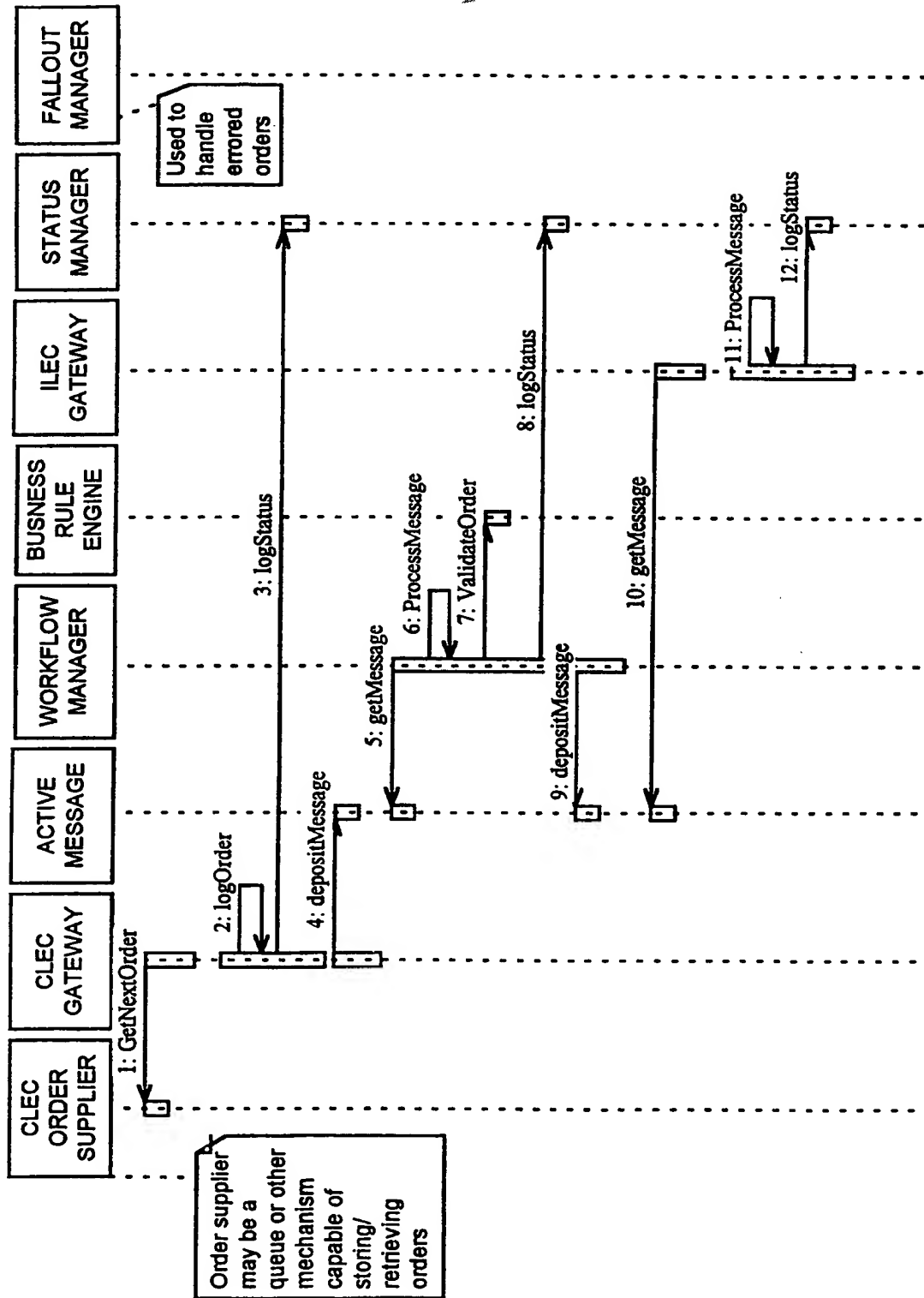


FIG. 7

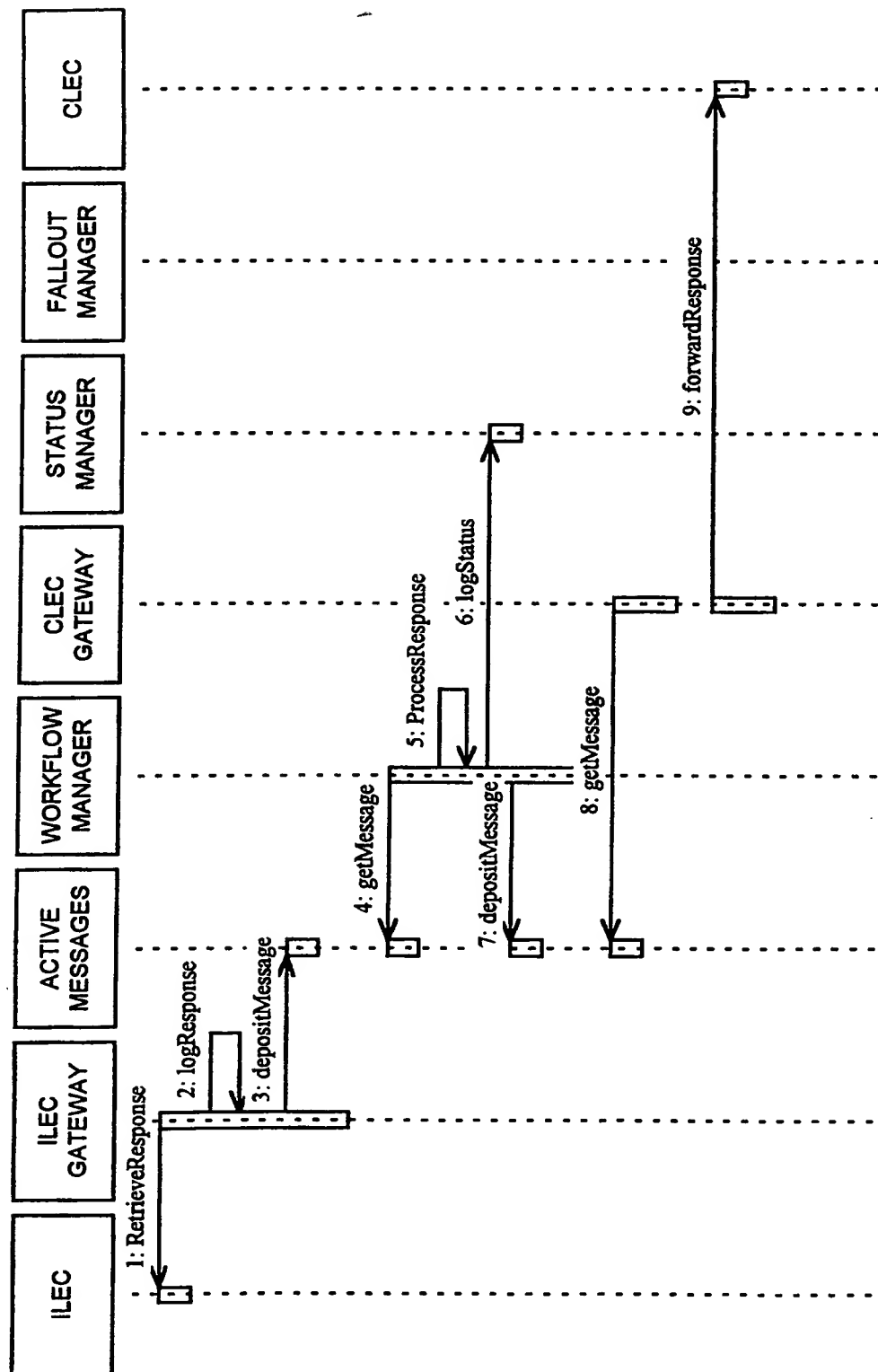
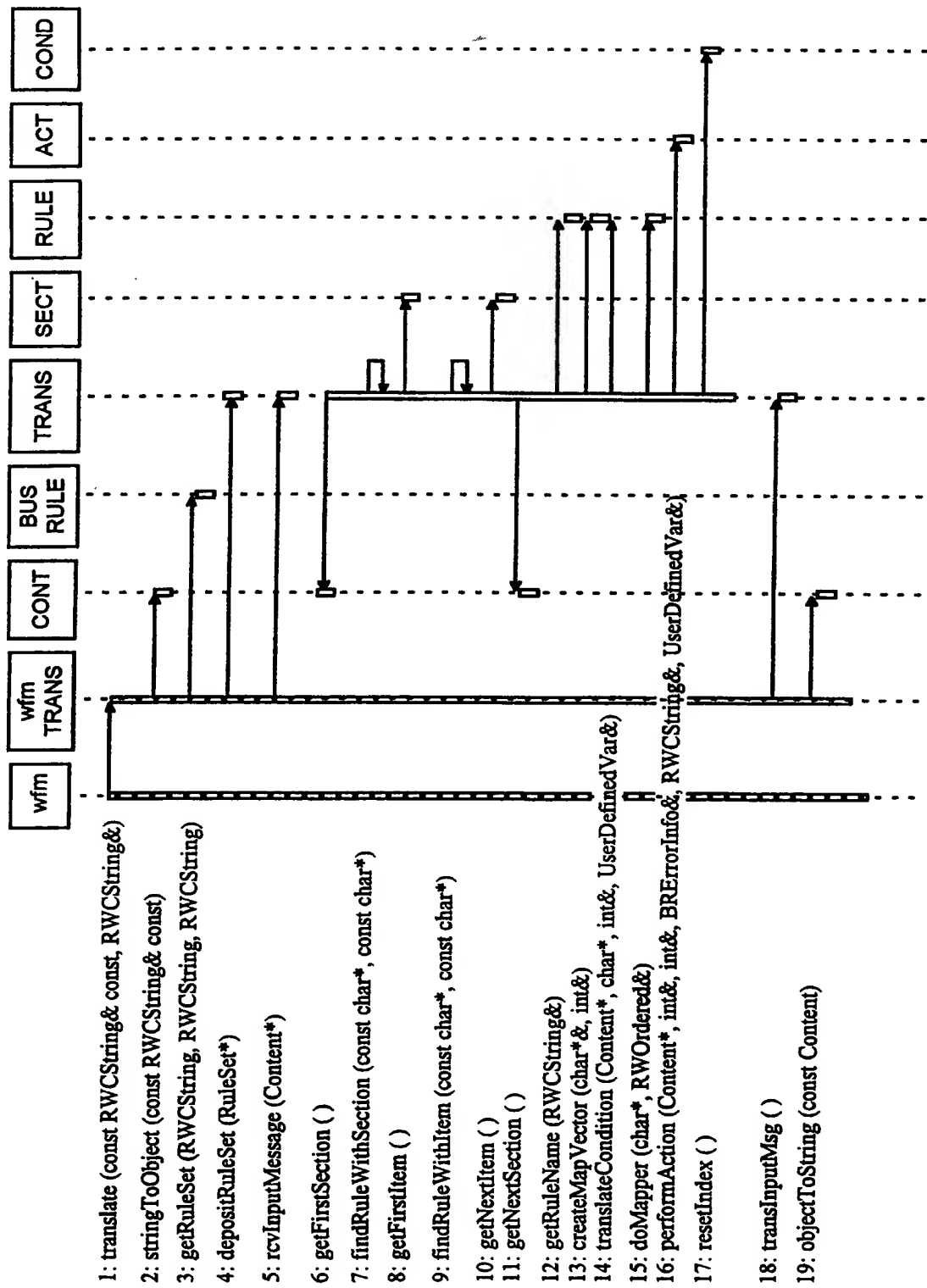


FIG. 8



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